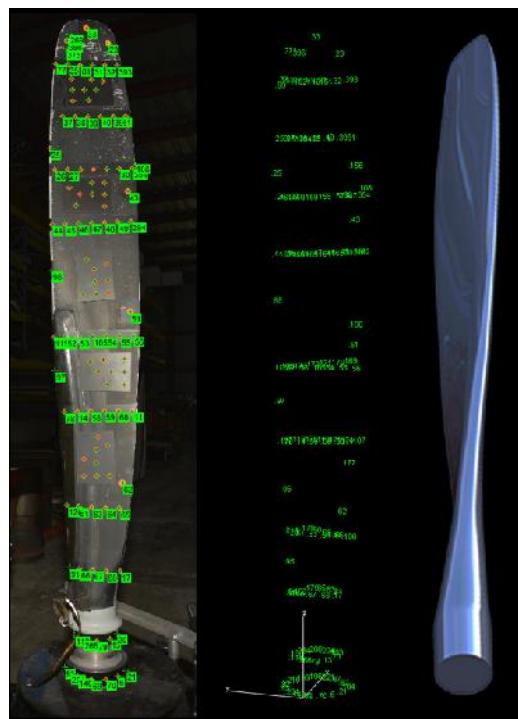


Propeller Blade 3D modeling using iWitnessPRO™

iWitnessPRO V3 was used to capture the complex geometry of a propeller blade.

The blade consists of a smooth, non-uniform shape that changes continuously from a cylinder at the root, to a thin almost flat blade at the tip, along with the blade having a changing twist from root to tip. The geometry was accurately captured using close-range photogrammetry, and finalized in CAD for solid modeling.

The blade was targeted with adhesive back stripe tape targets along with use of iWitnessPRO's red coded targets for fully automatic measurement. An off-the-shelf Nikon D800 with 20mm lens was used for the imaging.



iWitnessPRO's exported DXF file was imported to a CAD program where the CAD model was created for later use in a computational fluid dynamics (CFD) software. The goal of the modeling was to analyze a rotating blade and predict its aerodynamic properties of temperature, pressure, mass and velocity in three axes. The CFD software calculates the changing values of all these properties in a superimposed mesh of millions of tetrahedrons, and then integrates the results to define thrust, drag and moments.

The accurate results from the iWitnessPRO photogrammetry software system, along with its ease of use in both imaging and computer analytics, made the 3D modeling process simple & cost effective, yet extremely powerful for capturing and assisting in predicting the blade's characteristics.

This project and post analysis was accomplished by Engineers at Dow International L.L.C.